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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,064	04/19/2004	Cyril Cabral, JR.	YOR919990509US3 (13171AB)	2363
23389	7590	12/14/2004	EXAMINER KIELIN, ERIK J	
SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA GARDEN CITY, NY 11530			ART UNIT 2813	
			PAPER NUMBER	

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 10/827,064	<b>Applicant(s)</b> CABRAL, ET AL.	
	<b>Examiner</b> Erik Kielin	<b>Art Unit</b> 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 24-28 is/are pending in the application.
- 4a) Of the above claim(s) none is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/19/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

The restriction requirement of 10 September 2004 is withdrawn as it did not take into account the Preliminary Amendment of 19 April 2004.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 26 and 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

It is acknowledged that the specification discusses the feature of a thin oxide layer present near the surface of the substrate stating in pertinent part at p. 7, lines 20-32,

“The Si-containing substrate may optionally include a thin oxide layer 12 that is present near the surface of the Si-containing substrate; the oxide layer is at the interface between the alloy layer and the Si-containing substrate... Typically, the oxide layer is a thin oxide having a thickness of from about 0.1 to about 3.0 nm.”

This thin oxide 12 is however consumed during the course of fabrication of the contact and is not in the final product. In this regard the specification states at p. 10, lines 27-32,

“The structure shown in FIG. 1b may optionally be pre-annealed under conditions that are sufficient in forming a metal rich germanium silicide phase layer 18 in the structure (See FIG. 1c). It should be noted that

**oxide layer 12 becomes part of the silicide layer after annealing.”**  
(Emphasis added.)

As clearly shown in the progression from Fig. 1B to 1C, the thin oxide layer 12 is shown to be gone. Accordingly, the feature of a thin oxide layer of any dimension in the claimed contact is not enabled.

3. Claims 26 and 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In addition to the aforementioned rejection of claims 26 and 27, the features of an oxide near the surface of the substrate of any dimension are new matter. The claims 26 and 27 are new and are unsupported by the instant specification.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,810,924 (**Legoues et al.**), assigned to the same assignee as the instant application, in view of US 6,165,903 (**Besser et al.**).

Regarding claim 24, **Legoues** discloses an electrical contact to a region of a silicon-containing substrate comprising,

a substrate having an exposed region of a silicon-containing semiconductor material (paragraph bridging cols. 5-6); and

a first layer of Ni silicide, wherein said substrate and said first layer are separated by a Si-Ge interlayer **12** (col. 6, lines 6-24; paragraph bridging cols. 14-15).

**Legoues** does not indicate that the nickel silicide is nickel monosilicide (NiSi).

**Besser** teaches that it is known in the art that NiSi, by contrast to the disilicides of Ti and Co (TiSi<sub>2</sub> and CoSi<sub>2</sub>), is the low resistivity phase of nickel (col. 1, lines 22-30).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use nickel monosilicide as the nickel silicide in **Legoues** because it is the low resistivity phase of the nickel silicide, as taught to be notoriously well known in the art by **Besser**.

Regarding claim 25, **Legoues** discloses the electrical contact of Claim 24 wherein said silicon-containing semiconductor material comprises, *inter alia*, single crystal Si and SiGe (paragraph bridging cols. 5-6).

Regarding claim 26, **Legoues** discloses the electrical contact of Claim 24 further comprising an oxide layer **26** present near a surface of said substrate (col. 6, lines 63-65).

6. Claims 24-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,698,869 (**Yoshimi et al.**) in view of **Besser**.

Regarding claim 24, **Yoshimi** discloses an electrical contact to a region of a silicon-containing substrate comprising,

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a substrate **201** having an exposed region of a silicon-containing semiconductor material (Fig. 14); and

a first layer of Ni silicide **74**, wherein said substrate and said first layer are separated by a Si-Ge interlayer **47** (Fig. 14, paragraph bridging cols. 19-20, col. 20, lines 50-60, and col. 21, lines 50-54).

**Yoshimi** does not indicate that the nickel silicide is nickel monosilicide (NiSi).

**Besser** teaches that it is known in the art that NiSi, by contrast to the disilicides of Ti and Co (TiSi<sub>2</sub> and CoSi<sub>2</sub>), is the low resistivity phase of nickel (col. 1, lines 22-30).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use nickel monosilicide as the nickel silicide in **Yoshimi** because it is the low resistivity phase of the nickel silicide, as taught to be notoriously well known in the art by **Besser**.

Regarding claim 25, **Yoshimi** discloses the electrical contact of Claim 24 wherein said silicon-containing semiconductor material comprises, *inter alia*, silicon-on-insulator (SOI) (col. 19, lines 50-54).

Regarding claim 26, **Yoshimi** discloses the electrical contact of Claim 24 further comprising an oxide layer present near a surface of said substrate (col. 21, lines 60-64) also the oxide layer **203** can be considered the oxide layer near the substrate surface..

Regarding claim 28, **Yoshimi** discloses the electrical contact of Claim 24 wherein said substrate **201** is p-type doped (Fig. 14; col. 19, lines 50-54).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin  
Primary Examiner  
December 11, 2004